October 1963

EMO

NATIONAL DIGEST

The Canadian Civil Defence College

Organization for Disaster in B.C.

Fire and Fallout

The Calgary Plan for Natural Disaster

Soviet Ground Forces in Modern War

EMERGENCY MEASURES ORGANIZATION

THE EMO NATIONAL DIGEST

Published by the Emergency Measures Organization, Ottawa, Ont.

VOL. 3 NO. 5 OCTOBER 1963

TABLE OF CONTENTS

THE CANADIAN CIVIL DEFENCE COLLEGE ..... *A Report*

THE ORGANIZATION FOR DISASTER IN BRITISH COLUMBIA ..... *A. A. Larsen, M.D., D.P.H., M.P.H.*

FIRE AND FALLOUT ..... *Walmer E. Strope*

THE CITY OF CALGARY PLAN FOR NATURAL DISASTER ..... *Leslie C. Allan, M.B., Ch.B., D.P.H.*

SOVIET GROUND FORCES IN MODERN WAR ..... *Col.-General S. M. Shtemenko*

The EMO NATIONAL DIGEST is published bi-monthly to provide current information on a broad range of subjects dealing with civil emergency planning. The magazine is published in English and French and may be obtained by writing to the Emergency Measures Organization, Daly Bldg., Ottawa.

In addition to publishing articles which reflect Canadian Government policy the Digest may also publish articles by private individuals on subjects of current interest to the emergency measures programme. The views of these contributors are not necessarily subscribed to by the Federal Government.

Director: R. B. CURRY. *Editor:* A. B. STIRLING.

ROGER DUHAMEL, F.R.S.C.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1963

THE CANADIAN CIVIL DEFENCE COLLEGE

FOR a decade Canada has had a Federal Civil Defence College. What is the role of such an institution in our national life?

In 1950 the Federal Government, realizing the possibility of nuclear war, accepted responsibility for training specialists in civil defence and the following year the first civil defence staff courses were held in the Armouries of the Régiment de Hull, Hull, Quebec. Also in 1951 a technical school for civil defence instructors was established at the Connaught Rifle Ranges (a few miles upriver from Ottawa) and selected civilians received training in atomic, bacteriological and chemical warfare in the Army's school at Camp Borden, Ontario.

Gradually Connaught Ranges became the focal point for civilian training in various aspects of civil protection and the facilities there soon proved inadequate. Various plans for expansion were considered (including one to construct a Civil Defence College at Connaught Ranges) and finally in 1953 the former British Commonwealth Air Training Plan Airport at Arnprior, was selected as the site of the future Federal civil defence centre. A contract for renovation and reconstruction was let in October 1953 and the Canadian Civil Defence College began its operations at Arnprior in January 1954. It has continued to conduct courses there ever since.

Up to the end of 1953 the various civil defence courses held in Hull, Ottawa, Connaught Ranges and elsewhere, under the sponsorship of the Federal Government had been attended by 1275 candidates. There had been 801 civilians trained at the ABC School, Camp Borden, 82 had been trained at Staff Courses in the U.K. and the U.S.A., and 682 had passed through the Federal Civil Service Civil Defence Courses.

By 1954 a Canadian civil defence doctrine, based partly on Canadian studies and partly upon the experience of Britain, Western European Countries and the United States, had been evolved. The opening of a permanent College at Arnprior made it possible to teach this doctrine on a national basis.

Under the general direction of Federal Civil Defence Headquarters, the College was given the responsibility of developing standard courses and training key personnel in their operational duties. Instructors were trained for the various emergency services. Staff Courses in

72140-7—1

Sleeping quarters at the College consist of single and double units.

Orientation, Planning and Operations were given to the leaders who would be responsible for decisions in an emergency. Specialist Courses in Health, Welfare, Rescue, Radiation Monitoring, etc., were presented. Conferences were organized for Members of the Clergy, Mayors, etc. Over 10,000 persons were trained during this period in the various aspects of Civil Defence.

In 1959 a major rearrangement of civil defence duties and functions was made by the Federal Government and accepted by the Provinces. Civil emergency planning, both for the survival of the people and for the continuity of civilian government leadership and services now was considered a continuing function of government at all levels. Training policy became the responsibility of the Interdepartmental Training Policy Committee, chaired by the Director of the Emergency Measures Organization and drawing its members from National Defence, Health and Welfare, the RCMP and the CCDC.

It soon became apparent that a reorganization of the College was necessary to accomplish this task and two new sections were added: a Course Development Section to determine the training requirements of the other Departments and to assess how they could be incorporated in a Survival Course, and an Army Section to explain the new responsibilities of the Army in Survival Operations. A National Survival Orientation and Operations Course, sponsored by the Emergency Measures Organization, resulted from the efforts of this new team working closely with the departments and agencies planning for survival. By having civilian and military personnel attending these courses together, common new operational procedures were developed. Civilians and military learned to work together to prepare for the country's survival in the event of a national emergency.

At the same time Specialist Courses were continued for the departments of government with major emergency responsibilities.

The College was also requested to participate more actively in the presentation of Exercise Study Group Conferences and in the preparation of operational procedures for other specialist groups. It soon became evident that, with its limited capacity, the College could not cope with all the demands for courses. Rescue Instruction Training and Radiation Monitoring Training ceased at the CCDC in 1962, because it was felt that the provinces and municipalities had at their disposal enough instructors trained at the College, to undertake training in these subjects with the assistance of the Canadian Army.

Since each course given at the CCDC contained some lectures on basic civil emergency subjects, it was decided that a short course in orientation might profitably be developed for local presentation. Candidates for the College would then be better prepared and the time saved would be used for more advanced training. Most provinces were already giving some Orientation Training, but in order to develop a standard and to avoid overlapping, a detailed syllabus with supporting papers was prepared. Starting in January 1964, a two-week National Survival Organization, Plans and Operations Course will replace the present NSOR-NSOP Courses, each of which lasts one week. This course will be the logical sequence of the local orientation

One section of the main lounge where Canadians from one end of Canada to the other meet during a civil defence course.

course which will be considered as a necessary prerequisite for attendance at the College.

The Commandant retains the responsibility of authorizing Civil Defence/Emergency Measures Organization personnel to handle radioactive sources for training purposes. Standards have been set and a course has been developed to meet these standards. As training in radiation monitoring at local level is a provincial responsibility, the College examines the candidates only in their ability to handle radioactive sources.

Greater participation by the provinces and municipalities in the National Civil Emergency Training Programme can be achieved by closer liaison and greater assistance in the preparation of detailed syllabus, precis, papers, training aids, etc., for local courses.

An interesting example of assistance to provinces has been the development of French language courses to meet the growing requirements of Quebec and of the French speaking communities in other provinces. The first courses to be given in French at the College were National Survival Orientation and Operations Courses in September 1962. These were followed by specialist courses in Health, Agriculture, Welfare and by a Conference for Mayors and other senior elected officials of municipal government. One of the aims of the College is to conduct all courses in both languages in the proportion required by Canada's population. Good progress has been made and in most cases candidates now have a choice in the schedule of instruction in either English or French.

"Worthington Hall", the main lecture area at the College is used to address large groups and to stage complex demonstrations.

Large groups attending the College do much of their work in small syndicates. A typical group discuss a point of interest in one of the many syndicate rooms available at the College.

The CCDC schedule for 1963-64 lists the following types of course and conference: National Survival Orientation; National Survival Organization, Planning and Operations (commencing January 1964); Conference of Mayors, Municipal Emergency Welfare Directors; Agriculture Orientation; Welfare Emergency Feeding Staff Plans and Operations; Public Health; Welfare Federal and Provincial Directors Conference; Federal/Provincial Emergency Health Conference; Shielding Analysis Techniques; Technical Officers Nuclear Defence; War Supply Agency Conference; Radiological Defence (Federal Departments); Welfare General; Health Operations; Welfare Emergency Lodging Staff Plans and Operations; Veterinarians Orientation; Welfare Registration and Inquiry Staff Plans and Operations; Engineers and Architects; Welfare Emergency Clothing Staff Plans and Operations; Casualty Simulation Instructors; Nurse Educators.

It will be clear that the College is giving a positive lead to those who are drawing up emergency plans now and who would be responsible for emergency operations in time of disaster.

In July 1963, the College was transferred to the Emergency Measures Organization. In the development of a National Training Plan, the College will have to participate actively in the implementation of emergency measures in the provinces and municipalities as well as federally. New terms of reference are being prepared and the Canadian Civil Defence College is being developed to play the same role in emergency measures as a staff college does for the Armed Forces. In this way the College will be enabled to continue its significant contribution to our national security. •

72140-7—2

THE ORGANIZATION FOR DISASTER IN BRITISH COLUMBIA

A. A. Larsen, M.D., D.P.H., M.P.H., Director, Emergency Health Services, Department of Health Services and Hospital Insurance, British Columbia.

ABSTRACT

Plans are being formulated for organizing an Emergency Health Service in British Columbia. The same organization that is being created to deal with civilian casualties after an enemy attack should, it is felt, be able to assist in major natural disasters. Such an organization will have to remain ready but inactive for long periods; therefore the responsibility for planning, organizing and directing this service has been given to the Health Branch, Provincial Department of Health Services and Hospital Insurance.

A committee has been struck to advise the Health Branch, and a Director and a Health Supplies Officer have been appointed. Agreement has been reached as to who is to be assigned to work in the Emergency Health Service in the event of a nuclear attack, and sites have been selected for the stockpiling of medical equipment.

The Province has been divided into zones, and Emergency Health Service Directors have been appointed for each zone. Their duties include, among many others, organizing Advanced Treatment Centres and Emergency Hospitals, and developing an Emergency Public Health Service, an Emergency Blood Transfusion Laboratory and a Mortuary Service.

THE requirements for casualty care arising from military disaster demand that well co-ordinated plans be laid in peacetime and that there be a clear definition of administrative authority together with a line of succession of authority. To meet this requirement, and to deal with local disaster, British Columbia has prepared the plan described in the following paragraphs.

The plan that has been developed in British Columbia for meeting a major medical emergency is based on the premise that the same organization created to deal with civilian casualties following an enemy attack should also be able to deal effectively with local large-scale natural disasters. As the nature of the problem makes it likely that any organization created will have to remain ready but inactive for long periods of time, the responsibility for organizing and operating an emergency health service has been delegated to an existing official health agency rather than creating another voluntary organization. The Provincial Department of Health Services and Hospital Insurance has accordingly been designated as the responsible agency, and the development and operation of an emergency health service has been accepted by the department as another of their routine functions.

The Minister of Health has been given the responsibility for:

Planning, in advance, the steps that must be taken in the event of a major natural or a nuclear disaster in order that: (a) the injured may be adequately cared for; (b) the population may be protected from the effects of harmful radiation (and chemical or bacteriological agents) through knowledge of potential hazards and advice on protective measures; (c) the population may be protected from the spread of communicable disease; and (d) the maximum number of trained health workers and health facilities may be preserved.

Organizing an effective emergency health service in advance of a natural disaster.

Directing all of the health services in the province in the event of a major emergency.

Provincial Organization and Administration

A Director of Emergency Health Services has been appointed from the Health Branch staff to carry out the detailed planning and organization necessary to develop this service.

A Health Supplies Officer has also been appointed to supervise the distribution and maintenance of Federal emergency health supplies throughout the province, and to determine the location and quantity of existing local supplies.

A Provincial Emergency Health Services Advisory Committee has been formed which consists of representatives from the B.C. Division, The Canadian Medical Association, the B.C. Registered Nurses' Association, the B.C. Pharmaceutical Association, the B.C. Veterinary Association, the B.C. Association of Hospital Administrators, the Canadian Red Cross, the St. John Ambulance Association, and others. This committee, which meets once or twice a year, advises the Minister on matters dealing with the development of emergency health services for the province as a whole.

Alternate Headquarters.—In the event of a natural disaster in which the Emergency Health Services are asked to give assistance, operations will be directed from the headquarters of the Health Branch. In the event of an anticipated or actual nuclear attack, arrangements have been made to relocate the Victoria and Vancouver head offices of the Health Branch. A small group including the Deputy Minister will maintain liaison with the other arms of Civil Defence and with armed services at the Regional Emergency Site in Nanaimo. The Directors of those divisions of the Health Branch directly involved in providing an emergency health service, together with an appropriate staff, will move their offices to health unit headquarters located outside the target area. In the event of a sudden emergency, the director of the health unit located at the Regional Site will act as the Director of Emergency Health Services until relieved by the Deputy Minister or his successor.

Training.—In order to give the members of the emergency health services team the necessary administrative and professional training, all the key members of the Provincial Health Branch staff have attended orientation and technical courses relating to their specialty, at either Provincial or Federal Civil Defence Training Colleges.

TABLE I.— Professions and Groups with Special Skills Assigned to Emergency Health Services by Provincial Civil Defence Authorities and the War Manpower Authority

Group I

The professions whose members are required to exercise *judgment* in the diagnosis, treatment and prevention of disease.

- Physicians and surgeons
- Dentists
- Veterinarians
- Registered nurses

Group II

The professions whose members possess *skills* required in the diagnosis, treatment and prevention of disease.

- Pharmacists
- Radiographers
- Sanitary inspectors
- Licensed practical nurses
- Hospital orderlies
- Hospital ward-aids
- Clinical laboratory technicians and technologists
- Public health laboratory technicians and technologists
- Dental technicians, assistants and hygienists
- Industrial first-aid attendants
- Psychologists
- Physiotherapists and occupational therapists
- Optometrists
- Chiropodists
- Chiropractors
- Osteopaths
- St. John Ambulance Brigade members
- Trained civil defence health workers (Advanced Treatment Centres and Emergency Hospitals)

Group III

Personnel needed to control the administrative and logistic aspects of emergency health services.

- Public health administrators
- Public health engineers
- Health educators
- Health physicists
- Hospital administrators
- Medical record librarians
- Morticians
- Ambulance drivers

Students in training and retired members of the above three groups.

Group IV

Personnel needed to provide administrative and logistic services to support health activities.

- Dietitians
- Personnel directors
- Stationary engineers
- Purchasing directors
- Housekeeping directors
- Laundry managers
- Trained clerical personnel
- Refrigeration engineers
- Maintenance workers (electricians, plumbers, carpenters)
- Security guards
- Housekeepers (cleaners, maids)
- Food service workers (cooks, butchers, helpers)
- Laundry workers
- Motor pool drivers and motor mechanics

Note 1.—Group IV personnel will not be assigned exclusively to emergency health services in the first instance, but will be requisitioned from the War Manpower Authority as needed.

Note 2.—Veterinarians will be released for duties in their own field as soon as the immediate need for emergency casualty care is over.

72140-7—2½

Personnel Assigned to Emergency Health Services

Agreement has been reached with the Provincial Civil Defence authorities, the War Manpower Authority and the Armed Services that certain professions and people with special skills (Table I) will be assigned exclusively to emergency health services in the event of a major natural disaster. It is planned to issue to every person in the emergency health services an identifying pass which will state their special skill. This card will list the local health centres that are being used as rallying points and from which personnel will be assigned to the casualty care centres where they are most needed.

The military commitments of every person holding an important emergency health administrative position have also been listed and passed on to the Armed Services so that essential members of the emergency health services will not be assigned to important military duties which might conflict with their function as emergency health services administrators.

Family Plan

Arrangements are being made to notify all members of the administrative staff of the Health Branch, located within the two target areas, concerning the place at which their services will be required in the event that it is necessary to evacuate the Vancouver or Victoria offices. The staff are being asked to arrange with their families a point where they can meet in the event that circumstances do not allow time for them to rejoin their families before evacuating.

Zone Organization and Administration

For civil defence administrative purposes, the province has been divided into six zones (Table II). In two of these zones target areas have been designated (Vancouver and Victoria).

The medical health officer located at each of the zone headquarters has been designated as Zone Emergency Health Services Director and made responsible for: (a) *planning, organizing and directing* all of the emergency health activities within the zone (exclusive of the target areas); and (b) *advising* the zone co-ordinator on emergency health matters. The other medical health officers located within the zone, in respect of emergency health activities, come under the direction of the Zone Emergency Health Services Director.

The senior medical health officers in the two target areas (Vancouver and Victoria) have been designated

TABLE II.

Division		*Headquarters*	*Emergency health services director*
B.C. Region	Peace:	Victoria	Deputy Minister of Health
	Operational:	Nanaimo	Deputy Minister of Health
Target areas:			
Vancouver	Peace:	Vancouver	Senior Medical Health Officer, Vancouver
	Re-entry Operations:	Chilliwack	Senior Medical Health Officer or Assistant Medical Health Officer, Vancouver; failing them—Director, Upper Fraser Valley Health Unit, Chilliwack
Victoria	Peace:	Victoria	Senior Medical Health Officer, Victoria
	Re-entry Operations:	Duncan	Senior Medical Health Officer or Assistant Medical Health Officer, Victoria; failing them—Director, Central Vancouver Island Health Unit, Nanaimo
Zones:			
VIZ (Vancouver Island)	Peace:	Nanaimo	Director, Central Vancouver Island Health Unit, Nanaimo
	Operational:	Nanaimo	Director, Central Vancouver Island Health Unit, Nanaimo
VAZ (Lower Mainland)	Peace:	Vancouver	Director, Upper Fraser Valley Health Unit, Chilliwack
	Operational:	Chilliwack	Director, Upper Fraser Valley Health Unit, Chilliwack
KAZ (Kamloops)	Peace:	Kamloops	Director, South Central Health Unit, Kamloops
	Operational:	Kamloops	Director, South Central Health Unit, Kamloops
NEZ (Nelson)	Peace:	Nelson	Director, Selkirk Health Unit, Nelson
	Operational:	Nelson	Director, Selkirk Health Unit, Nelson
PGZ (Prince George)	Peace:	Prince George	Director, Northern Interior Health Unit, Prince George
	Operational:	Prince George	Director, Northern Interior Health Unit, Prince George
PRZ (Prince Rupert)	Peace:	Prince Rupert	Director, Skeena Health Unit, Prince Rupert
	Operational:	Prince Rupert	Director, Skeena Health Unit, Prince Rupert

as Target Area Emergency Health Services Directors and have been made responsible for: (a) *planning, organizing and directing* all emergency health services within the target area; and (b) *advising* the target area co-ordinator on health matters.

It has been agreed that emergency health services personnel who are forced to withdraw from the target area will come under the overall direction of the Zone Emergency Health Services Director. In such an event the Target Area Emergency Health Services Director will have the specific duty of planning for the re-entry of health personnel into the stricken area in co-operation with the Zone Emergency Health Services Director and the armed forces.

The Zone Emergency Health Services Directors have, in most areas, formed Zone Emergency Health Services Committees, made up of representatives from the medical, nursing, dental and other professions with skills useful in providing casualty care. These committees serve the same function within the zone as does the Provincial Advisory Committee at the provincial level.

The Zone Emergency Health Services Directors have on record a large amount of basic information, which is being kept up to date. This includes:

1. The name, address and occupation of everyone in the zone whose services are to be reserved exclusively for emergency health purposes.
2. A list of the available medical supplies and equipment to be found in retail stores, physicians' offices and hospitals within the zone.
3. The buildings in the zone which could be used for the care of the sick and injured. Arrangements have been made with the zone co-ordinator to have these buildings reserved for this purpose.

Emergency health services at the zone level have been divided into:

A—Emergency Medical Services
- (a) Casualty care
- (b) Continuing medical care

B—Public Health Services

The immediate direction of the medical services (casualty care and continuing medical care) will be carried out by private physicians recruited for this purpose. The direction of the public health aspects will be undertaken by the full-time medical health officers in the zone, all under the overall direction of the Zone Emergency Health Services Director.

A—Emergency Medical Services

(a) *Casualty Care*

(i) *Existing hospitals.*—Plans are being formulated in conjunction with the British Columbia Hospital Insurance Service to encourage all hospitals within the province to develop an up-to-date disaster plan to deal not only with internal emergencies such as fire, explosion, accident or flood damage, endangering the safety of patients and staff, but also with major natural or military disasters which might result in a sudden overwhelming increase in case-load. Several hospital "Disaster Institutes", where such plans may be discussed and demonstrated, are planned for various centres in the province.

(ii) *Transportable emergency hospitals.*—Plans are being developed to reserve selected junior and senior high schools for use as emergency hospitals. These will be developed further when equipment for these hospitals is received.

(iii) *Improvised hospitals.*—In the zones adjacent to the target cities plans are being made to raise, staff, equip and supply small improvised hospitals entirely from local resources, to augment the other medical resources of the community.

(iv) *Advanced treatment centres.*—A number of the zone emergency health services directors have, in conjunction with their local medical societies, raised and trained the basic staff for one or more advanced treatment centres (A.T.C.'s). Equipment for training has been supplied for a period of time to each of the centres where an A.T.C. has been raised, and the nucleus staff have been encouraged to put on demonstrations in conjunction with other civil defence exercises being held at the time. It is planned very shortly to begin the pre-positioning of equipment for advanced treatment centres in strategic centres throughout the province near the assembly areas for the army mobile survival columns.

As an experiment, one advanced treatment centre and casualty collecting unit has been made mobile by putting it on a specially designed truck which can be used as an ambulance when not loaded. This will allow demonstrations to be put on in almost any part of the Province and will give one mobile operational A.T.C. for military or civil disasters.

(b) *Continuing Medical Care*

(i) *Welfare centre clinics.*—Plans are being made in conjunction with the welfare authorities to set up medical clinics with limited facilities at welfare centres to care for incoming evacuees. It is hoped in this way to prevent people with relatively minor disabilities from taking up urgently needed hospital facilities.

(ii) *Outpatient departments* are also planned to take care of the medical needs of the community during

the period of emergency. It is proposed to locate these in suitably situated private medical offices and staff them with a minimum of professional personnel.

B—Public Health Services

For public health purposes, British Columbia is divided into two metropolitan health departments and 18 rural health units, which together cover 98% of the population of the province. Each department or unit is under the direction of a full-time physician, qualified as a specialist in public health. As mentioned earlier, the organization of emergency medical services and the provision of an emergency public health service is now fully accepted in the province as one of the responsibilities of the official public health agencies.

In many of its aspects, emergency public health services are only an expansion of the routine day-to-day work of the public health staffs. Plans are now going forward, however, to secure special training for large numbers of public health workers in a number of highly technical fields. These include: (1) the monitoring of radiological and chemical hazards; (2) the detection, identification and control of biological agents causing communicable disease; (3) the inspection and decontamination of food and water; and (4) the interpretation and provision of health hazard information to the public.

The Zone Emergency Health Services Directors, in co-operation with the Zone Civil Defence Co-ordinator, have also arranged for large numbers of selected civil defence workers to receive training in the first-aid or home-nursing courses given by St. John Ambulance and the Canadian Red Cross.

Emergency Blood Transfusion Service

Because the Red Cross Blood Transfusion Depot is located in a target area (Vancouver), and in order to meet the anticipated needs for large quantities of blood in the reception area in the event of a nuclear attack, it is planned to stockpile a large number of blood-taking and blood-giving sets outside of the target area. These will be rotated by the peace-time blood transfusion service to prevent deterioration. In the event of a disaster, it is planned that the regional pathologist will assume direction of the transfusion service in the zone, using the existing lists in the hands of local Red Cross officials.

Laboratory Services

It is recognized that there will be a great need for an expanded laboratory service to provide the diagnostic tests essential to the care of casualties, the preservation of an adequate level of sanitation, and as a defence against biological warfare. In order to cope with this need, plans are being made for increasing laboratory facilities in the reception areas through the use of staffs recruited from evacuees from the target area. These recruits will be used to augment existing hospital staff and to operate the mobile laboratories which are expected to be available shortly. •

". . . The international situation looks much brighter these days than it has for a long time, and there is some reason to expect further improvement. I hope, as I am sure all of you do, that the current trend towards a substantial easement of international tensions will continue and that a day will come when one can say with reasonable certainty that war with nuclear weapons no longer need be considered seriously even as a possibility. That day, unfortunately, has not yet arrived. There is no guarantee, whatever we may hope, that the present mild international climate will not degenerate again into freezing weather, with or without warning. Nuclear war remains a possibility, a remote one perhaps but nevertheless a worrisome one; and as long as this condition persists, we must continue the effort to improve our chances of surviving. In short, the civil emergency preparedness programme is an insurance policy. As with other forms of insurance, there will be no regrets if we never collect on the policy, but should it be found in an emergency to have expired, the cries of recrimination will be loud indeed . . ."

Extracted from an address by
The Honourable C. M. Drury to
The Canadian Industrial Preparedness Assoc.,
Ottawa, October, 1963.

FIRE AND FALLOUT

Statement by Walmer E. Strope, Director for Research, Office of Civil Defense, before Subcommittee No. 3 of the Armed Services Committee of the House of Representatives, July 10, 1963

SEVERAL WITNESSES before this subcommittee have advanced the thesis that the real civil defense problem is fire following nuclear attack rather than fallout and, indeed, that high-altitude detonations would be a more likely mode of attack against cities and populations in general. Dr. Schreiber, of MIT, was particularly positive on this point. He summarized his position in the following way:

> "As long as their capacity to deliver nuclear weapons by ICBM's remains limited, the Soviets would almost certainly use high-altitude airbursts of large bombs against cities, causing no fallout whatever but blasting and burning vast areas around their targets."

The detonation that Dr. Schreiber predicted, which was a 30-megaton explosion at an altitude of 17 miles, would indeed cause no close-in fallout. Neither would it produce significant blast effects on the surface below. Its entire capability to harm a city would lie in its supposed fire-producing potential.

It is my purpose to show that the fire threat from the detonation postulated by Dr. Schreiber would be small under ideal conditions and negligible under most conditions. It is further desired to set the record straight on the dimensions of the fire threat as seen by the Department of Defence and to discuss the reasons why the use of nuclear weapons primarily for incendiary effects is unlikely.

One of the major factors affecting the fire-making potential of nuclear weapons is the ignition threshold for various combustible materials. This is a major point at which Dr. Schreiber went wrong in his calculations. Curiously, he selected 12 calories per square centimeter as his criterion on the basis that this energy would cause serious skin burns to people exposed to the heat flash although this fact bears no direct relationship to the question of ignition of fires. However, he would get considerable support for his choice from the information on the ignition thresholds cited in Table 7.44 of the *Effects of Nuclear Weapons* (ENW), the document prepared by the Department of Defense from which Dr. Schreiber took his data. For example, this table indicates that for a 10-megaton airburst, the ignition threshold for newspaper is about 6 to 8 calories per square centimeter. This is not inconsistent with the 6 and 12 calories per square centimeter used by Dr. Schreiber.

It so happens that at the time the current edition of the Effects of Nuclear Weapons was being prepared, in 1961, there existed new experimental data on the ignition thresholds for high-yield weapons obtained by the Naval Radiological Defense Laboratory that indicated that the information in the *Effects of Nuclear Weapons* was much too low. These data were published in unclassified form in 1959. They differed so markedly, however, from the older information upon which the ENW was based that it was decided within the Department of Defense not to change the numbers until a new set of measurements could be obtained to corroborate the NRDL data. The new measurements have been completed within the past year by the Naval Materials Laboratory and fully corroborate the NRDL findings.

This committee is aware, I am sure, that the Department of Defense maintains a classified publication called the *Capabilities of Atomic Weapons* as well as the unclassified *Effects of Nuclear Weapons*. Both publications are prepared by the Defense Atomic Support Agency, which is the DoD agency concerned with obtaining information on nuclear weapon effects. The new information is so convincing that it is being incorporated into the classified publication and consideration is being given to issuing a correction to the *Effects of Nuclear Weapons* prior to its next revision date.

The new information shows that the ignition threshold for newsprint, which is among the most flammable materials likely to be exposed to thermal radiation, is about 34 calories per square centimeter rather than the 6 to 8 calories per square centimeter listed in the current edition of the *Effects of Nuclear Weapons*. This change, which has been suspected since 1959 and is now confirmed, markedly changes the sort of calculation attempted by Dr. Schreiber.

For example, his 30-megaton weapon detonated at an altitude of 17 miles barely exceeds the new ignition thresholds directly under the weapon and would ignite newspapers, for example, only within a radius of about 5 miles on a very clear day. As I will show shortly, the effects would be negligible under many other conditions.

The Defense Atomic Support Agency advises us that the optimum height of burst for thermal radiation has not been an object of study since the fire potential of a nuclear weapon has always been considered a bonus effect and one that is not readily predictable. However, in view of the question raised by Dr. Schreiber, such an analysis has been made and shows that the height of burst that maximizes the ignition radius is very nearly the same as the height of burst that maximizes low blast overpressures. The ignition radius does not exceed the range of moderate blast damage. In fact, it is only for a surface burst that ignitions can be expected in the light damage region. This is because the range of low overpressure is reduced below those of the air burst more than is the ignition radius.

Another serious problem affecting the reliability of estimates of the incendiary effect of nuc'ear weapons has to do with the range of action of the thermal effect; that is, how it is degraded and reduced in passing through the atmosphere. Dr. Schreiber uses the information in the *Effects of Nuclear Weapons* indiscriminately, even though it is clearly stated that the data and equations used are reliable only within a distance equal to one-half the visibility of the atmosphere. Since the average visibility in metropolitan areas is about 10 miles, this means that all distances over about 5 miles are open to question. As noted on pages 321 and 362 of the *Effects of Nuclear Weapons,* the transmission equations overstate the range of thermal radiation effects by an unknown but possibly large factor. I call this fact to the committee's attention because, although the Department of Defense is not prepared to recommend a change at this time, additional research can only result in a further reduction of the current estimates of fire ignition.

I would like to complete the story of the uncertainties confronting the designer of a high-yield, high altitude incendiary weapon system for use in attacking the United States (or any other area, for that matter) by mentioning the problem of weather and climate. Weather and climate enter the nuclear fire problem in several important ways. The transmission of the thermal energy from the burst to the target area is strongly affected by the presence or absence of clouds, their types and locations, by visibility, by surface reflectivity, and by other meteorological factors. The ignitability of the materials in the target area and the possibility of spread of fires after initial ignition are directly influenced by the weather conditions at the time of attack and during the weeks preceding attack. For high-altitude detonations, a critical factor is the amount of cloud cover between the weapon and the target area. Cloud transmission of thermal radiation, assuming 100% for a clear day, is about 30% for light cloud to about 3% for dense cloud, based on solar radiation data.

A detailed analysis of cities of 100,000 population or larger shows that the average city has but 120 clear days a year and less than 10 percent have as much as 200 days. The average American city has about 120 days of heavy cloud and over 100 days a year it is raining. Thus, for the average American city, the high-altitude incendiary weapon system would be fully effective ⅓ of the time, partially effective ⅓ of the time, and completely ineffective ⅓ of the time.

No military planner would be satisfied with a weapon system of such low reliability. However, it might be considered that, even so, one might be able to choose a particularly advantageous day for the attack. Unfortunately, the condition when the skies are clear simultaneously over all or nearly all of our major cities is extremely infrequent and hard to predict. Most of the time some of our cities have clear skies and others have cloudy skies. So the Soviet planner would have to settle for an uncertain chance of starting fires in some fraction of our cities as a result of attacks on all.

This difficulty facing the high-altitude incendiary attack is further emphasized when one considers the percentage of time that "opaque" cloudiness occurs in various parts of the country. Since industry and population need a reliable source of fresh water, most of our cities are located in regions of high rainfall and, consequently, in areas where cloudy conditions are common.

There is considerable uncertainty about the extent of ignition of fires following nuclear attack but current information clearly supports the statement of Secretary Pittman in earlier testimony to the effect that the major fire threat would be in areas of extensive blast damage. Furthermore, any changes from additional research is expected to result in further reduction of the current estimates. This does not mean that the Office of Civil Defense is not aware of the importance of fire defense. A large part of our research effort is directed toward the development of measures to mitigate fire damage. At the present time, the OCD finances more fire research than any other organization in this country. We believe that this effort gives us the best understanding of the fire threat available today.

The position advanced by the Department of Defense is that an effective system of fallout shelters is an essential element of any reasonable civil defense effort and that there are low-cost ways of achieving this essential protection. In urging this program, it has never been implied that it would be a panacea, that it would provide protection in the impact area, or that emphasis on achieving fallout protection left no room

for other important functions of civil defense, such as warning, fire defense, rescue, medical aid, monitoring and communications. These are also important parts of the civil defense system. What we do believe is that these functions will be most effective if founded on the firm base of an operational shelter system. This is particularly true of fire defense.

We can expect large numbers of survivors in shelters —even the shelters now being marked and stocked—in the fringe areas of blast and heat around a surface nuclear detonation. In the first place, these shelters offer complete protection against the flash burns that Dr. Schreiber used as his criterion of effectiveness for thermal radiation. They also provide a small but significant degree of protection against blast, even though they are classed as fallout shelters. Therefore, we would expect many survivors in the region of 1 to 7 psi blast overpressure. For a 5-megaton surface detonation, this region of moderate damage extends from 4 miles to 12 miles from ground zero and includes most of the damaged region.

It is in this region of survival that the secondary threat of developing fires from ignitions caused both by blast and thermal radiation will be encountered. Our research work shows that the most promising time to control this threat is in the first half hour after attack when the ignitions are small and capable of being snuffed out. These studies are corroborated by historical experience at Hiroshima.

At Hiroshima, very little firefighting was reported inside the larger reinforced-concrete buildings that survived the explosion, some at very close range. Most survivors apparently fled to safer locations quickly. However, in at least four instances, people remained on fire guard and effectively prevented extensive fire damage by extinguishing incipient fires.

An outstanding example was Building No. 24 on the records of the U.S. Strategic Bombing Survey, which was located only a quarter mile from ground zero. Here, about a dozen people remained in the building, snuffed out fires, and survived in the heart of the Hiroshima fire storm area. This incident, and others, show more than the obvious point that fire guard actions in snuffing out small fires are feasible and effective. They also indicate that such action can be effective in a particular building despite fires in other buildings in the same area.

The existence of a community shelter system is the foundation upon which this type of emergency action can be built. When people are brought together or assigned to community shelters, they become available for organization, for assignment to functions, and for training to do vital tasks. Research is underway to develop the proper basis for these actions.

We are also studying various means of markedly reducing the fire vulnerability of urban areas. These measures, most of which are quite simple, are being considered for incorporation into emergency plans. Also, as Secretary Pittman mentioned in previous testimony we are exploring and developing active thermal countermeasures—devices that would interfere with the arrival of thermal radiation at the target. We would expect to concentrate these measures in areas of high fire-susceptibility and in regions of high industrial value. An effective system seems to be achieveable in the short term with an initiation time of 2 minutes and a sustaining time of 6 hours for about $200,000 per square mile protected. We expect to reduce costs considerably through further developmental work.

In reacting to Secretary Pittman's statements on this matter, Dr. Schreiber said that a crash research and development program to translate these prospects into reality would be worth more than the fallout shelter program. We see no reason to make a choice here and intend to pursue both. But it does highlight the fatal flaw in Dr. Schreiber's argument. Thermal radiation is the most fragile effect of a nuclear detonation. Any opaque substance stops it completely. Even modest weather changes make marked changes in its effectiveness. If the Soviets were to commit themselves to the sort of weapon system Dr. Schreiber suggests, the potential effectiveness of civil defense would be sharply increased. We don't think they are likely to make such a mistake. •

> Highly reflecting and transparent substances do not absorb much of the thermal radiation and so are relatively resistant to its effects. A thin material will often transmit a large proportion of the radiation falling upon it and thus escape serious damage.
>
> "THE EFFECTS OF NUCLEAR WEAPONS".

THE CITY OF CALGARY PLAN FOR NATURAL DISASTER

Leslie C. Allan, M.B., CH.B., D.P.H., Medical Officer of Health,
City of Calgary.

ABSTRACT

The details of a plan to cope with any natural disaster in the city of Calgary or surrounding area are presented in terms of: (1) the method of alerting personnel, (2) the mobilization of hospital authorities, additional hospital personnel, Civil Defence volunteers and Emergency Service facilities to deal with large numbers of injured victims; and (3) arrangements for the collection, feeding, clothing and temporary rehousing of those rendered homeless and deprived of the basic essentials of life.

THE dictionary defines a disaster as anything ruinous or distressing that befalls; a sudden great misfortune, a calamity or mishap.

A flood, an explosion, a train wreck or the collision of two airliners above a city, a hurricane, earthquake or landslide are prime examples of mishaps which inevitably result in large numbers of dead, injured or homeless persons requiring emergency care and attention.

In the Calgary Disaster Plan, a natural disaster is defined as any untoward occurrence, short of war, which produces a number of casualties in excess of 30 who require emergency treatment at the city hospitals at any one time, or which demands emergency welfare treatment for homeless persons in excess of the number that could be handled by normal agencies.

The plan was promoted by the Civil Defence Authority in conjunction with hospital, police, welfare and other agencies.

Immediately on receipt of information that a local disaster has occurred, the mayor, on the authorization of the Civic Council, shall order the Director of Civil Defence to put the plan into effect and to direct its operation according to the nature of the circumstances.

It has been assumed that the first information regarding the occurrence of a disaster coming within the terms defined will be received by either the local police department or the R.C.M.P. The police will then immediately notify the Director of Civil Defence by telephone or, if he cannot be reached, one of his Deputy Directors.

Once it has been decided that the disaster plan should be put into operation, the Director of Civil Defence assumes all responsibility for its scope. For simplicity, the plan will be considered under two separate sets of circumstances: (1) A disaster where the major emphasis required will be the care and attention to many injured human casualties, requiring hospitalization. This is met by the hospital disaster plan. (2) Where the major emphasis will require the care and attention for large number of dazed and homeless people—the welfare disaster plan.

1. HOSPITAL DISASTER PLAN

Each of the following Calgary hospitals has a separate yet carefully integrated role to play in the overall plan: the Calgary General Hospital, the Holy Cross Hospital, the Colonel Belcher Hospital, the Baker Memorial Sanatorium, and The Salvation Army Grace Maternity Hospital.

The first three, because of their more elaborate facilities, have been designated as Acute Casualty Emergency Treatment Centres. These hospitals would receive and provide treatment for all disaster victims.

The Baker Memorial Sanatorium will act as a reception centre for patients requiring continuing hospital treatment who may have to be evacuated from one of the first three hospitals to make room for disaster casualties. Normal emergency cases occurring in the city would still be taken to the nearest hospital. However, if any of these were considered by the medical authorities not to be of sufficient urgency, they would be diverted to the Baker Memorial Sanatorium for treatment during the emergency period.

All maternity cases occurring in the city during the period of emergency could be cared for at the Grace Maternity Hospital.

The Director of Civil Defence in putting the plan into operation will immediately alert these hospitals and ask them to make preparations to receive an influx of disaster casualties in accordance with their designated specific duties. If the disaster occurs between 8 a.m. and 11 p.m., the Director will alert all personnel and transport registered under the plan by a special announcement to be broadcast by all local radio and television stations, repeated at 10-minute intervals over the following 30 minutes. If the emergency warning has to be issued between 11 p.m. and 8 a.m., a telephone "fan-out" system will go into effect.

The police, meantime, will dispatch appropriate forces to the scene of the disaster and set up traffic controls around the hospitals. They will refuse admission to the hospitals of traffic not connected with the

disaster and of individuals not in possession of a Civil Defence (CD) Disaster Emergency Identity Card.

The administrators of the hospitals in due course will inform the Director of Civil Defence concerning: (a) the approximate number of disaster casualties that can be received; (b) the numbers of patients who must be moved to make room for disaster casualties separated into the following classifications: (1) can go home, (2) must be transferred for continuing treatment to the Reception Centre Hospital; (c) what additional bedding might be required to enable hospital auditoria to be converted into emergency wards.

Action at the Acute Casualty Emergency Treatment Centres

1. A team of four nurses with first-aid supplies will be immediately dispatched to the scene of the disaster from the Calgary General Hospital. They will be sent by the first emergency transport vehicles (taxicabs) reporting to the hospital.

2. Sufficient hospital supplies for 30 maternity cases will be dispatched from the Calgary General Hospital to the Grace Maternity Hospital by emergency transport vehicles.

3. Patients who may be discharged to their homes will be assembled at prearranged locations to await emergency transportation (taxicabs).

4. Patients requiring continuing hospital treatment, chiefly sitting cases, but considered suitable for transfer to the reception centre, Baker Memorial Sanatorium, will be assembled in prearranged locations to await emergency transportation vehicles. All patients will carry with them adequate documents to ensure their continuing treatment at the reception hospital.

5. Hospital staffs will supervise the loading of these patients into the emergency transportation vehicles.

6. Steps will be taken to clear the hospital auditoria and other pre-selected areas for the conversion to emergency and resuscitation ward services if the situation demands.

7. An information bureau, staffed by Civil Defence personnel, will be set up in a pre-selected area, for the dissemination of information to people inquiring about casualties. The hospital authorities will keep this Bureau fully informed.

8. Casualties will be received into the hospitals at pre-selected points quite apart from those to be used for the discharge and transfer of outgoing patients.

Action at the Reception Centre Hospital

1. The administrator will inform the Director as to the number of patients he can take for continuing care and will take steps to make the necessary accommodation immediately ready for use.

2. The administrator will set aside accommodation to deal with the emergency cases directed to the hospital during the immediate disaster period.

3. If patients have to be discharged to provide this accommodation, the Director will provide the necessary transport from the emergency vehicle pool.

4. If the sudden extra load of patients directed to the Sanatorium overtaxes the supply of drugs and surgical instruments, immediate requisition may be made on one of the local hospital supply companies.

Action at the Maternity Centre

1. In order to free beds quickly for immediate use, the Administrator will designate patients who may be sent home, or transferred to the reception centre for continuing treatment.

2. A team of six doctors has been assigned to report to the hospital for duty immediately on receipt of the disaster warning.

In order to meet the conditions of a disaster emergency, large numbers of volunteer personnel have been registered and assigned specific duties at the scene of the disaster and at the hospitals involved in the treatment of casualties. Each volunteer has received full instructions on the action to be taken on the issue of the disaster warning. All volunteers have been enrolled in Civil Defence and been issued with a C.D. "Disaster Emergency" identity card allowing them unchallenged access to their assigned destinations during the emergency. A check is made every three months in respect of all personnel and vehicles registered under this plan, to ensure that they are still on call.

At each of the hospitals an up-to-date register is maintained of personnel assigned to specific team duties as follows:

Directing staff	2	doctors
Triage	3	"
Minor treatment team	6	"
Major treatment and resuscitation team	12	"
Burns and plastic surgery	1	doctor
Psychiatry	1	"
Facio-maxillary injuries	1	"
Evacuation officer	1	"
Registration of casualties	3	volunteers
Nurses	45	
Pharmacists	2	
Stretcher bearers	24	
Information bureau	6	

Reserves and house officers as allocated by the directing staff.

Action at the Civil Defence Headquarters

Upon receipt of the disaster emergency call, the normal staff will make their way to the Civil Defence

headquarters with all possible speed and remain on duty until the emergency has ended. Additional volunteer staff consisting of telephonists and motor cycle dispatch riders will also report for duty as soon as possible. The staff will issue blankets, stretchers and first-aid equipment kits to all the auxiliary ambulances reporting for emergency duties.

Action at the Scene of the Disaster

When the disaster warning is issued by radio, television, or telephone fan-out, specially selected and briefed volunteer personnel will immediately make their way to the Civil Defence headquarters. These first-aid personnel will help in the loading of auxiliary ambulances with blankets, stretchers and first-aid kits. Forty rescue, first-aid and stretcher-bearer personnel will be conveyed to the disaster scene by the auxiliary ambulances. These volunteers will immediately go to work to recover, rescue, and help in the transportation of the casualties to the treatment hospitals.

In the meantime, a team of four doctors will make their way independently to the disaster scene in their own cars. They will be notified by telephone of its location by the Civil Defence Director. They will be joined by the four nurses who will leave the general hospital by auxiliary transport after the warning is received.

A coroner, called by the police, and four ministers representing the more common religious denominations will also proceed independently to the disaster scene, should the local emergency warning be issued.

The Civil Defence Controller and his deputies, having been advised of the disaster location by the C.D. Director's staff, will make their way there independently in their own cars. They will direct the work of the volunteer C.D. personnel in assisting the medical teams in every way possible. Supplies of specially designed disaster casualty tags are included in the emergency first-aid kits which will be brought to the disaster scene by auxiliary ambulances. The patrol cars of the city police also carry these tags as part of standard equipment. The C.D. Controller at the disaster scene will ensure that a tag, completed as accurately as possible, is affixed to all victims, both living and dead, removed from the disaster area. This tag serves as the admission document at the treatment hospital.

It will be imperative that both Civil Defence H.Q. and treatment hospitals be in direct contact with the scene of the disaster. A Civil Defence radio equipment unit with operators has been detailed to proceed to C.D.H.Q., the disaster scene, and to each of the major hospitals. These units will establish radio communication with each other as soon as possible, transmitting any information required for the orderly conduct of the emergency. At the disaster site, the radio crew will give their appreciation of the situation and keep hospitals informed as ambulances leave with casualties.

The Auxiliary Ambulance Service

There are two major ambulance firms in Calgary. On the issue of the disaster warning, one company will dispatch all its ambulances and personnel to the disaster site when alerted by the C.D. Director. The other firm will be ordered to stand fast in the city to deal with all the normal day-to-day ambulance requirements of the general public.

Certain local business firms have agreed to provide 35 vehicles, mostly the large van type, with a driver, for use as auxiliary ambulances. Once the disaster warning has been issued, these vehicles will report immediately to the Civil Defence H.Q., for duty. These vehicles will be loaded with two stretchers and two blankets each and first-aid kits. These vehicles will also pick up the volunteer stretcher bearers and rescue personnel going out to the scene of the disaster. All these auxiliary ambulances will affix a special disaster plan label to the top centre of their windshields. These have been issued together with specific deailed instructions. Any vehicle bearing such an insignia will have unquestioned right-of-way within any roadblocks created around the disaster area. All such vehicles will come under the direct command of the C.D. Controller in the disaster area.

Auxiliary Transport Service

An agreement has been made by the C.D. Director and certain taxicab companies in the city to provide emergency transport in the event of the issue of the disaster warning. When the warning is issued, approximately 110 city taxicabs will respond to the call in the following manner. Fifty taxicabs will immediately proceed to the Calgary General Hospital, 30 to the Holy Cross Hospital and 30 to the Colonel Belcher Hospital. These vehicles will transport to their homes all patients whom the hospitals consider may be prematurely discharged, or conveyed to the hospital designated as the reception centre. The driver of each taxicab will keep a record of the charges which accumulate in the carrying out of these duties. When the need for emergency vehicles has passed, each company will submit a consolidated account to the Director of Civil Defence for payment by the City.

One mobile canteen provided by a local catering establishment will also report to C.D.H.Q., upon issue of the disaster warning. The driver will then be instructed to proceed to the disaster area, where refresh-

ments and cigarettes will be provided to the casualties and to the official C.D. workers. Another mobile canteen, from the Salvation Army, will provide refreshments and cigarettes to the volunteer staff at the treatment hospitals. This latter unit will tour the various hospital sites while the disaster emergency lasts, catering to the refreshment needs of the volunteer civil defence personnel on duty.

Immediately after the disaster warning has been issued, a temporary morgue will be set up in one of the curling arenas for reception of the dead. It will be staffed and run by a team of morticians from the various funeral homes in the city. When it has been decided that the bodies may be removed from this temporary morgue, the representatives of the funeral homes will arrange among themselves for their disposal.

The Welfare Phase of the Calgary Disaster Plan

This plan has been drawn up to cope with a natural disaster occurring in the Calgary area which might cause large numbers of people suddenly to be rendered homeless and deprived of the basic essentials of life. A sudden flood, a massive fire, an earthquake or devastating windstorm are examples of events which could result in large numbers of people requiring humanitarian care. It will be appreciated how vital this kind of care would be if the disaster occurred during a spell of sub-zero weather.

To meet such an emergency it is intended to establish Emergency Welfare Centres in strategic locations in the city at which it will be possible to collect the homeless and minister to their basic needs.

It is planned that Emergency Welfare Centres, some 18 in number, will be set up in church halls having large assembly areas, with cooking and feeding facilities. At each of these centres, a ladies' auxiliary will be willing to undertake the staffing of the establishment.

A list of the church halls selected and placed at the disposal of the Civil Defence authorities has been prepared, showing the name of the centre and its location, together with the name and phone number of the officer of the church who has accepted the responsibility for activating the centre upon receipt of a disaster warning issued by the Civil Defence authorities.

Upon receiving information that a disaster involving many homeless persons has occurred, the police will inform the Director of Civil Defence or one of his deputies by telephone. The Director will then consult with the Mayor and ask for authority to put the plan into operation.

Based on the information received concerning the location, type and magnitude of the disaster, the Director will take steps to activate the requisite Emergency Welfare Centres by immediately notifying his Director of Welfare.

Immediate basic welfare needs are considered to be the following: (a) emergency registration of the disaster victims, (b) emergency clothing, (c) emergency feeding, (d) medical aid, and (e) emergency re-housing.

The Director of Welfare will be responsible for the general co-ordination of the Welfare operations. He will inform the heads of special services (emergency clothing, feeding and rehousing, etc.) and all of them will report to the Civil Defence H.Q. for duty. Each head of a special service will alert a member of his division to take up duty at each welfare centre opened to receive disaster victims.

Meantime, the police will have dispatched appropriate forces to the disaster scene and to each Welfare Centre about to be opened. The police will direct all persons rendered homeless by the disaster to the nearest Emergency Welfare Centre.

The official of the church providing the Emergency Welfare Centre will immediately commence a telephone "fan-out" warning to those members of the ladies' auxiliary registered for "first shift" duty to proceed there as soon as possible to take up their respective assignments.

The official assumes the role of the Welfare Centre manager and is responsible for co-ordinating all phases of the activities performed therein, during the time it remains open and functional.

At each Emergency Welfare Centre there is a qualified first-aid attendant registered for duty. From his list, the Deputy Civil Defence Director will detail a first-aid attendant to report to each centre opening to receive disaster victims.

These volunteer workers will supply any medical attention necessary.

Operation of a Typical Emergency Welfare Centre

The Welfare Centre manager will allot appropriate space in his building for the following provisions.

(A) *Emergency Registration Service*

Every person, regardless of age, will be registered as soon as possible after arriving at the centre. Registration will be made on a special form providing space for the following particulars: (a) full name, (b) address at the time of the disaster, (c) name, address and phone number of relative or friends who could be contacted to provide shelter, (d) if in need of medical aid or clothing, (e) signature of the disaster victim, (f) address where re-housed. Every person registered will be given a "Registration for Emergency Lodging"

form to be taken to the Emergency Lodging Officer for detailed completion.

(B) *Emergency Clothing Service*

The Welfare Centre emergency clothing official will interview each victim of the disaster presenting a clothing requisition form issued by the Registration section. A consolidated list of clothing items will be compiled and, as the urgency of the situation demands, the various items will be requisitioned from the Emergency Clothing Director at the C.D.H.Q. Blankets will be used to cover ill-clad individuals as a temporary expedient until suitable emergency clothing is obtained. A record of the clothing issued will be kept and a receipt obtained from the recipient.

At headquarters, the Director of Emergency Clothing will obtain the bulk clothing items from such organizations as the Salvation Army, and church organizations which maintain stocks of used clothing. Should the resources of these agencies be unable to meet the demands, the necessary purchases will be made from the trade. All bills incurred will be passed on to the Civil Defence Director for eventual payment. Blankets will be available from Canadian Red Cross or Canadian Army depots. Clothing supplies will be transported to Welfare centres by vehicles provided by the Emergency Transport Service.

(C) *Emergency Feeding Service*

The Feeding Section will arrange to serve hot beverages to the disaster victims and staff as soon as possible after the centre opens. Within a matter of a few hours, cooked meals will be available for everyone. These meals, prepared under emergency conditions, will be plain, good and wholesome. Menus for breakfast, lunches and dinner have been compiled and listed in detail. These menus have been converted into total quantities of each item required, sufficient to feed 100 people. Arrangements have been made with a local groceteria adjacent to each selected Emergency Welfare Centre, to provide the bulk supplies of food, day or night, upon receipt of a requisition from the Welfare Centre manager. The first requisition to cover food supplies for the first meal would be made as soon as the Emergency Welfare Centre opens. It would be on the basis of meals required for the full number of people capable of being received at the Emergency Centre, and would of course include staff. The requisition covering food supplies for the subsequent regular meals of the first day would be based on the actual numbers remaining at the centre. Should the service of meals have to continue beyond the first day, requisitions for subsequent days would be based on the numbers actually served dinner on the day previous to that for which supplies are required. All bills incurred in the purchase of emergency food supplies would be certified by the Welfare Centre manager and finally passed to the Director of Civil Defence for payment after the emergency period is over.

A sample menu for 100 persons might read as follows:

Breakfast	*Item*	*Quantity*
Fruit	Canned fruit	20 x 20 oz. cans
Pork sausages	Sausages	33 lb.
Baked beans	Baked beans	33 x 15 oz. cans
Bread and butter	Bread	16 loaves (sliced)
	Butter	7½ lb.
Beverage	Instant coffee	1 lb.
	Tea bags	25
	Sugar	12 lb.
	Milk	5 lb. (powdered)
	Cream	6 pt.
Lunch		
Apple juice	Apple juice	6 x 48 oz. cans
Sliced corned beef	Corned beef	34 x 12 oz. cans
Cabbage	Cabbage	30 lb.
Potatoes	Potatoes	40 lb. fresh
		5 lb. powdered
Cake	Slab cake	20 lb.
Coffee	Instant	1 lb.
	Sugar	6 lb.
	Cream	6 pt.
Dinner		
Mushroom soup	Mushroom soup	48 x 10 oz. cans
Hamburger steak	Minced beef	33 lb.
Peas and potatoes	Peas	33 x 15 oz. cans
	Potatoes	5 lb. powdered
		40 lb. fresh
Instant chocolate pudding	Pudding mix	16 pkt.
Coffee	Instant	1 lb.
	Sugar	6 lb.
	Cream	6 pt.

(D) *Medical Aid*

A small room off the main assembly area would serve as a first-aid post. The first-aid attendant would be able to attend to persons requiring care.

(E) *Emergency Lodging Section*

The chief of the Emergency Lodging section will nominate a member of his service to represent him at each Emergency Welfare Centre. This representative will interview the senior member of a family unit who presents him with a "Requisition for Emergency Lodging".

Where the homeless family is able to give the name and telephone number of a relative or friend who might be able to provide shelter, the lodging officer will make contact with the party named and arrange, if possible, for the family to be collected and temporarily re-housed.

Where the disaster victims are without any help from their own resources, they will be re-housed as quickly

Concluded on page 20

SOVIET GROUND FORCES IN MODERN WAR

COL.-GENERAL S. M. SHTEMENKO

Red Star, 3 January 1963

Recent debates in Soviet military journals on the relevance of past experience to modern war, and on the use of ground forces have shown that the role envisaged in Soviet military doctrine for the ground forces is now considerably greater than that assigned to them in recent years.

IN ALL WARS, including the Great Fatherland War, the ground forces have played the main role in armed conflict. They were the basic and the largest of our armed services and their combat operations, supported by the air forces and, in coastal areas by the Navy, decided the ultimate outcome of the war.

The great importance of the ground forces lay in the fact that in them was concentrated the basic fire power and striking power of the armed forces, possessed by infantry weapons, mortars, artillery and tanks. The character of ground forces operations was also shaped by the material and technical base on which they depended.

Now qualitatively new weapons, nuclear weapons and missiles, which can fulfil the most important tasks of war exceptionally rapidly and effectively, have been extensively developed. One may reasonably ask what effect the new weapons have had upon the role and importance of the ground forces, and whether views on their combat use have changed?

These questions have been treated in various ways in the world military Press. In accordance with the 'massive retaliation' strategy, the American military command for example at one time reduced the role of the ground forces to basic occupation functions, i.e. the seizure and holding of enemy territory after an annihilatory blow had been inflicted on him by other armed services with strategic nuclear weapons at their disposal.

Recently, however, these views have been radically changed. The West has concluded that in a future war powerful and mobile ground forces will be indispensable. In accordance with this, the US Government, while strengthening its nuclear potential, has begun to pay much more attention to all-round development of the ground forces, increasing their numbers and combat personnel, and increasing the fire power of formations and units, chiefly by introducing nuclear weapons. In the US Army these weapons have been introduced at all levels—from army groups to battalions inclusive. The range of power of nuclear ammunition for the ground forces is being extended, and the means of delivering them to their targets improved. According to the foreign Press, the NATO ground forces have nuclear ammunition of from 1.5 to 3,800 kiloton yields (*sic*). In the USA low yield (100 to 500 tons) and very low yield (1 to 36 tons) nuclear ammunion, intended for use in small nuclear systems, has been developed and tested.

Our Soviet military science has always based itself, and still does base itself on the fact that victory in war is won by the combined efforts of all types of armed force. In line with this view we have developed them, rearmed them and reformed their organization.

In the interests of the security of the Soviet Union and the whole socialist camp we have to maintain powerful armed forces capable of withstanding agression by the Imperialist states, and the Communist Party and the Soviet Government have made considerable efforts to ensure that the ground forces have technical equipment of high standard, flexible and firm organization, and that their personnel are complete masters of modern methods of training and conducting resolute, highly mobile and dynamic combat operations.

The appearance of our ground forces has now completely changed. They contain a new arm of service—the operational-tactical rocket troops—which are the main means of destruction. Armoured and motorized infantry forces have altered a great deal in respect of equipment, organization and combat. The standard of their equipment and training permits them to operate successfully both in nuclear conditions and when conventional weapons alone are used.

The Soviet ground forces have at their disposal a wide range of nuclear warheads, which ensure that they can fulfil their basic tactical and operational missions. The ground forces' rocket troops can destroy any target or objective, either at close range or in the deep rear. Moreover rocket equipment continues to be

improved: the range is being increased, the accuracy improved, the manoeuvrability and reliability of direction systems perfected.

The equipment of the ground forces with nuclear weapons does not mean that other weapons have lost their importance. Only skilful co-ordination of nuclear missiles and conventional weapons can ensure success in battle.

Since tanks can exploit the results of nuclear strikes better than any other arm of service, armoured equipment is being steadily improved. Our modern tanks are superior to the best models of foreign tanks in their combat qualities, and are capable of engaging them successfully in any conditions.

As can be seen from the foreign Press, the further improvement of tanks is proceeding mainly along the lines of increasing fire-power, especially while on the move; improving the protective qualities of armour; increasing the range and cross-country capability; especially in overcoming water obstacles.

Tanks-infantry co-operation

For tanks to carry out combat missions successfully, the motorized infantry should be able to co-operate well with them. A tendency has appeared abroad to turn armoured personnel carriers into combat vehicles for the infantry by installing light cannon or machine guns. However, alongside this, research work on the creation of special combat vehicles for the infantry is also carried out in the USA.

Since tanks are still the basic strike weapon of the ground forces, intensive work is being carried out to develop means of fighting them. Anti-tank guided missiles are acknowledged as the latest means of combatting tanks and the ones with the most prospects.

Modern rifled artillery has been qualitatively altered in our ground forces. Its range, rate of fire and productiveness have considerably improved. Recoilless and especially jet-propelled artillery, which is an extremely effective means of destroying open grouped targets, has been further developed.

The constant threat of the extensive use of powerful and rapid means of air attack directly against the troops has meant intensive development of ground forces' anti-air defence weapons. In all strong military states 'surface-to-air' guided missiles and anti-aircraft artillery sites are used for air defence, and can effectively combat any air target at various altitudes.

Means of intelligence, communications, automated apparatus for troop control and various types of engineering equipment continue to be developed in the ground forces.

The development of new arms and combat equipment is one of the main causes of the considerable changes in the organizational structure of the ground forces.

The organizational structure of our tank and motorized infantry troops incorporates all the good points accumulated from the combat experience of the last war and post-war development. Now tank and motorized infantry formations and units have great fire- and strike-power, and sufficiently manoeuvrability and direction. A motorized infantry division has considerably fewer personnel than a similar division at the end of the Great Fatherland War. However, the power of one salvo, even without rocket weapons, has increased by more than four times and the number of tanks has grown considerably. There is no doubt that in the future the organizational structure of tank and motorized infantry formations will be improved with the introduction of new combat equipment.

Equipping the ground forces with nuclear weapons, various rockets and other of the latest combat equipment has brought about profound changes in the nature of their tasks and their methods of combat.

All modern military theoreticians agree that in a nuclear war ground forces' offensive operations would be carried out at great depth with decisive aims, at high speed, and without any continuous fronts. The front line will become purely symbolic, and combat operations will take the form of battles and engagements at focal points.

In NATO armies special attention is given to attaining high attack speeds. In exercises and manoeuvres offensive operations with a speed of sixty to seventy kilometres a day are being worked out. These attack speeds are nothing new for us. They were attained by our tank forces in a number of operations during the last war.

Taking into account the mutual endeavours of the opposing sides to resolve their tasks by active offensive operations, forces will often have to conduct encounter battles and engagements. These, as a rule, will commence with nuclear strikes by the rocket forces and air forces and will be characterized by the rapid deployment of forces from the march and rapid penetration into the depths of the enemy deployment.

Breakthrough of prepared enemy defensive positions will be accomplished not by 'gnawing through it', as in the last war, but by inflicting nuclear strikes and rapid attacks by tank and motorized infantry forces.

The attacking troops will have to overcome extensive zones of radio-active contamination and destruction, the result of massive use of nuclear weapons, and carry out anti-nuclear and anti-chemical defence, which they never had to do in the past.

In the course of the offensive operations the troops will also have to conduct defensive operations in some sectors. The basis of the defence will be nuclear strikes, a flexible and effective fire-system including artillery, tanks, infantry weapons and air force strikes.

It is impossible to use the great capabilities of the ground forces in armed conflict successfully unless adequate attention is paid in peacetime to their combat training.

The number of units and sub-units, detachments and crews classified as 'excellent' has increased. The number of outstanding soldiers in military and political training and qualified specialists has increased. More extensive mastery of combined qualifications has begun to guarantee interchangeability, and hence reliability of combat equipment in any conditions. A struggle has begun to reduce the time needed to bring weapons into combat readiness.

History shows that aggressors have always relied on secret preparation and surprise attack in unleashing a war.

The crisis in the Caribbean showed once again the importance in the age of nuclear and rocket weapons of the demands of our Party and the Soviet Government to all armed forces, including the ground forces, to be in constant combat readiness and to show the greatest vigilance.

It is well known that in present conditions the time factor plays a truly decisive role in the combat training of the forces. The readiness of units and sub-units must be counted literally in minutes, even seconds in the case of the rocket forces. This compels us to find ways of bringing the troops quickly to the highest level of combat readiness.

The basis of combat readiness and its chief indicator is a high level of combat training in each sub-unit, unit and formation and above all their field training.

Field training includes the general training of the ground forces to fit them for skilful performance of decisive, highly mobile, continuous, rapid and dynamic combat operations with a powerful enemy, in complex conditions when both nuclear and conventional weapons are being extensively used by both sides.

Importance of tactics

A solution to these problems can only be achieved by the study of tactical themes such as the march and encounter battle, attack on 'enemy' defence combined with the forcing of water obstacles, etc., and close connection of tactical themes with firing training. Field training is acquired by troops in field conditions, during tactical exercises in which sub-units of all arms of service are being improved by all types of combat training. Practice shows that it is best to allocate the greater part of instruction time to field training and to alternate it between day and night.

An indispensable condition for raising the quality of troop field training is to reject stereotyped work. Only by creating a complex situation corresponding to the nature of modern conflict can activeness, reliability and steadfastness in battle be achieved.

It is very important that every soldier, sergeant and officer be able to use individual means of defence skilfully, adapt himself to the terrain, move speedily through contaminated areas and liquidate the consequences of enemy nuclear and chemical attack. Without firm practice in these types of combat training there can be no talk of a high level of field training of sub-units, units and formations.

Timely execution of combat tasks depends mainly on a high level of specialized training and co-ordination on the part of rocket, artillery, engineer, chemical and communications sub-units. Thus the duty of special sub-unit personnel is to increase their mastery daily and improve the co-ordination in work.

Success in combat operations depends now as never before on the ability of commanders, staffs and troops to use all the power of modern fire means effectively, to inflict powerful strikes on the enemy and manoeuvre fire flexibly. This is possible only if all personnel have a high level of firing training, know the performance of their weapons perfectly and how to use them in a masterly fashion. Without an excellent knowledge of weapons there can be no talk of their skilful use.

The increase of combat readiness is inconceivable without a high level of technical training on the part of all personnel in the ground forces. Special attention must be paid in technical training to the practical mastery of new equipment. Personnel must discover and rapidly eliminate damage and defects, always keep equipment ready for use and also be able to expedite service and repairs in field conditions in rapid time. Consequently it must be a matter of honour for every soldier, sergeant and officer to become master of his speciality quickly.

In modern conditions the role of intelligence is growing considerably. To carry out these missions reconnaissance units must find gaps and spaces in the enemy combat deployment penetrate into the depths of his defence, detect the presence of nuclear weapons, determine their co-ordinates and rapidly transmit this information.

A high state of combat readiness presupposes the existence at all levels of firm, steadfast and flexible

leadership of the troops based on unified-command,* the cohesion of staffs and the consciousness of every serviceman. Successful execution of tasks in combat and political training depends upon the organization and precision of work of staffs. In planning combat training they must consider the peculiarities in the training of every detachment and unit, giving special attention to field training and also the generalization and implementation in the practice of combat training of the most improved methods of instructing and educating the personnel.

To ensure proper training facilities must be improved and increased until they meet the requirements of combat training.

*The system under which military commanders considered sufficiently reliable are allowed to function without a Political Officer to oversee them.

To increase the combat readiness of the forces means to strengthen troop discipline and organization, to increase educational work, to raise the vigilance and Communist consciousness of every soldier, sergeant and officer. The power of weapons and combat equipment can be shown in full force on the battlefield only when all personnel are organized and disciplined to the highest degree and utterly devoted to the Soviet people and our Party. If one person in a detachment or crew or one specialist is late or delays fulfilment of an order there is a danger that the execution of a combat mission will be disrupted.

Work on the further development of military theory and practice must be considered an obligatory part of the daily service activity of every commander and officer and of political organs at all levels. ●

Continued from page 16

as possible by the Lodging Section. The Welfare Centre lodging officer will report his requirements to the chief of Emergency Lodging Service and obtain from him an allocation of temporary accommodation. As soon as the families to be re-housed have been fed, received any medical attention or emergency clothing necessary, they will be conveyed by car to the lodgings allotted to them. The emergency lodging form will be competed showing the address to which the family has been sent.

The Chief of Emergency Lodging will make contact with the motels and hotels in the city, warning them to receive an influx of homeless people and ascertaining what accommodation they have available.

When in possession of the requirements of each Emergency Welfare Centre, he will allot the available accommodation to the best possible advantage. If the accommodation put at the disposal of Civil Defence is not sufficient to meet the requirements of the disaster, an appeal will be made to the general public over radio and television for householders willing to take victims into their homes.

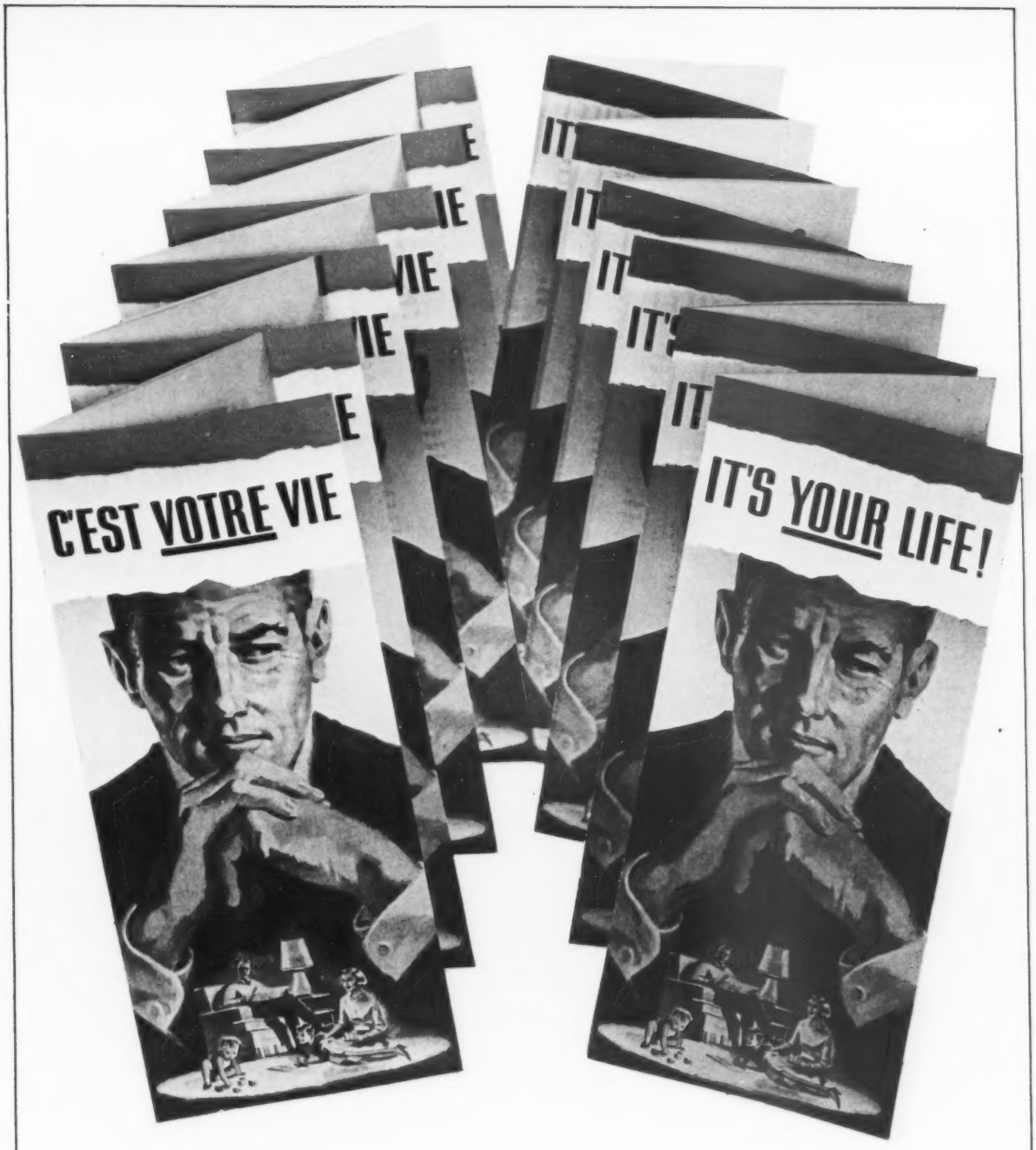
Under any disaster conditions, prompt medical aid to the injured, and food, shelter and clothing for the homeless, provide a practical approach in times of human suffering.

The provision of these fundamental needs forms the foundation of the present Calgary Municipal Disaster Plan. ●

FOR FURTHER READING

YOUR BASEMENT FALLOUT SHELTER—BLUEPRINT FOR SURVIVAL NO. 1
BASEMENT FALLOUT SHELTER—BLUEPRINT FOR SURVIVAL NO. 2
FALLOUT ON THE FARM—BLUEPRINT FOR SURVIVAL NO. 3
11 STEPS TO SURVIVAL—BLUEPRINT FOR SURVIVAL NO. 4
SURVIVAL IN LIKELY TARGET AREAS—BLUEPRINT FOR SURVIVAL NO. 5
SIMPLER SHELTERS
WELFARE TIPS FOR SURVIVAL
YOUR EMERGENCY PACK

For your free copy write to EMO P.O. Box 10,000 in your Provincial Capital (NOT OTTAWA) or to your Municipal EMO/Civil Defence Co-ordinator.



One of a number of survival leaflets produced by the Emergency Welfare Division of the Department of National Health and Welfare. Free copies of all survival literature may be obtained by writing to Box 10,000 in your provincial capital.

If undelivered return to:
EMERGENCY MEASURES ORGANIZATION
Office 420, Daly Building,
Ottawa, Canada

OFFICIAL POSTAL FRANK

O. Blurry

Emergency Measures Organization